

PATENT SPECIFICATION

863,875

NO DRAWINGS.



*Date of Application and filing Complete Specification :
May 9, 1958. No. 15012/58.*

Application made in Germany on May 11, 1957.

Complete Specification Published : March 29, 1961.

Index at Acceptance :—Class 81(2), E1(H:K).

International Classification :—A61I.

COMPLETE SPECIFICATION.

Improved Metallized Wound Dressing.

We, GUSTAV ADOLF BARTH, of German nationality, of Wollendorf Post, Fahr/Rhein, Germany, and KURT LOHMANN, of German nationality, of 29 Landstrasse, Eppendorfer, Hamburg 20, Germany, trading together as FIRMA LOHMANN K.G., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a metallized wound dressing for the treatment of wounds.

Woven fabrics and foils that pass or absorb wound secretions because of their woven structure, because of a subsequent treatment in respect of the fibre material or because of absorbent layers forming a backing are known as wound dressings. Metallized layers, for example, smooth silver or aluminium foils, which are not themselves absorbent and therefore do not agglutinate with the wound secretions, have also been used as wound dressings. For this purpose use is made of metals that, by their chemical origin, do not interfere with the healing of the wound, especially metals that have a bactericidal action or promote healing in some other manner. The metallic perforated layer directly facing the wound is in this case combined in various ways with layers of absorbent material.

As a further form of wound dressing, it is known to use metal gauzes or metallized wide-mesh textile fabrics, which lie in the form of a grid on the wound, but do not themselves agglutinate with secretions or granulations because of their smooth surface. It is intended that the secretions should pass through the openings into absorbent

layers of textile fabric, fleece or absorbent cellulose.

According to the present invention there is provided a metallized wound dressing comprising a fine-pore absorbent fibre fleece, which is compacted after the style of a felt and the fibre surfaces of which carry a fine metal coating which is permeable to moisture. The absorbency of the carrier material is determined by the distribution and thickness of the metal applied. The surface layer can simultaneously be consolidated by the metal layer so as to be stable with regard to shape, and the absorbency or degree of permeability can be determined by the distribution and thickness of metal.

If the metal layer on the individual fibre is not completely closed, then the fibre, provided it is absorbent, can also absorb wound secretions. If the metal layer on the individual fibres is completely closed, the capillary suction power of the highly porous fibre layers is active.

The metallized carrier material may consist of single-layer fibre fleeces or of multi-layer fibre structures. The moisture-permeable metallized material may be backed with absorbent material, such as cellulose, on the side remote from the wound, when there is a relatively great amount of secretion.

If the carrier material consists of non-absorbent fibres, for example polyamide fibres, or other synthetic fibres, the absorbency is restricted to the capillary action of the fibre fleece.

In addition to surface wound dressings, which fit smoothly to the skin, according to the invention sanitary pads, tampons or the like can also be manufactured from the fleece material and be subsequently metal-

[Price 3s. 6d.]

lized, or else such sanitary pads or the like are manufactured from the metallized material.

The object of the invention is further illustrated with reference to the following non-limiting examples.

EXAMPLE 1.

A card fleece is coated with $\frac{1}{10}$ to $\frac{1}{2}$ gram of aluminium per square metre by cathodic sputtering. The metal coating covers the non-woven fibres of the fleece on all sides, but the fibre is still somewhat absorbent. From the material metallized in this way, wound dressings are cut to size and placed directly on the wound. The dressing is backed with cellulose compresses.

EXAMPLE 2.

A five-layer card fleece of polyamide fibres is passed through an apparatus for the deposition of silver by vaporisation *in vacuo*. The metal vaporised on to the fleece penetrates the entire fleece, which then constitutes a non-woven integral structure that is highly absorbent in extremely fine pores. These wound dressings have a completely smooth surface, fit closely to the wound and carry off the secretions of the wound, without sticking to the wound. The metallized wound dressing is backed with absorbent layers of cellulose or the like.

The bandaging materials or wound dressings produced according to the present invention have a completely smooth surface. They retain their shape and the internal cohesion is improved still more by the concentration of metal at the junction points of the fibres. All metals having an action promoting the healing of the wound, especially a bactericidal action, for example, silver, aluminium and zinc, are suitable for the metal coating, but it is also possible to use other metals, for example, the alkaline-earth metals, and also metallic oxides.

Suitable for the metallization are all processes that render possible the production of an extremely fine coating and a regulation of the quantity, while the surface of the wound dressing can be constructed in the desired density or porosity.

The material is stable to boiling. It can easily be kept sterile and is therefore particularly suitable for use in the case of large requirements, for example, in the case of mass injuries, heat injuries and so on. In this connection it is particularly advantageous that wounds covering a large area can be treated equally as well as small or deep wounds. The metallization causes the

material to be held taut without folds and, on the other hand, permits the passage of secretions even in the case of wounds of large area having a considerable amount of secretion. The porosity of a multi-layer fleece can be varied down to extremely small pore sizes, this being advantageous especially with regard to the adapting of the material to the wound treatment.

If, for the manufacture of the fleeces, fibres are used having a desired curl caused by the inner consolidation of the fleece or some other treatment, then the porosity is thereby further increased. A pore size of about 0.06 to 0.09 millimetre can be obtained. The fibre thickness may be about 0.02 millimetre, so that there may be many hundreds of single fibres per square centimetre in a fleece weighing about 40 grams per square metre.

WHAT WE CLAIM IS:—

1. A metallized wound dressing for the treatment of wounds, comprising a fine-pore absorbent fibre fleece compacted after the style of a felt, the fibre surfaces of which are provided with a fine metal coating which is permeable to moisture.

2. A metallized wound dressing as claimed in Claim 1, wherein the absorbency of the carrier material is determined by the distribution and thickness of the metal.

3. A metallized wound dressing as claimed in Claim 1 or 2, wherein the surface of the carrier material is consolidated by the metal layer so as to be shape-stable and the degree of permeability is determined by the dimensioning of the quantity of metal.

4. A metallized wound dressing as claimed in any of Claims 1 to 3, wherein the metallized porous fibre-fleece layer is backed with absorbent material.

5. A method of preparing a metallized wound dressing substantially as described with reference to either of the specific examples hereinbefore set forth.

6. A metallized wound dressing substantially as described with reference to either of the specific examples hereinbefore set forth.

GUSTAV ADOLF BARTH
and KURT LOHMANN,
trading together as
FIRMA LOHMANN K.G.,

Per: BOULT, WADE & TENNANT,
111/112 Hatton Garden,
London, E.C.1,
Chartered Patent Agents.